Abstract of the Disclosure

RUBBER FOR BABY BOTTLE NIPPLES, PACIFIERS, & SYRINGE PLUNGERS

The production of a protein free synthetic polyisoprene which has both low levels of chemical impurities and good physical properties has yet to be realized. It has now been envisioned that the use of neodymium catalyzed polyisoprene will offer the combined advantages of both a clean, as well as, high cis-1,4 polymer. Synthesis of polyisoprene rubber using a neodymium based catalyst system is described. Characterization of the material shows the absence of an ultra high molecular weight fraction and the presence of very high cis-1,4-microstructure. Gum stock and black filled compound studies comparing neodymium polyisoprene with natural rubber, titanium polyisoprene, and lithium polyisoprene have been performed. Results indicate that polyisoprene rubber synthesized using a neodymium catalyst system (Nd-PI) has similar stress-strain and tear properties as synthetic titanium polyisoprene. Analysis of residual volatile, extractable, and oligomer levels indicates Nd-PI is indeed a clean source of high cis synthetic polyisoprene. In the practice of this invention such Nd-PI is used in manufacturing articles used in manufacturing health care products, garments, clothing, and food and beverage packaging. Some specific applications include: bandages, drug delivery patches, suture tape, pharmaceutical closures, including syringe plungers and sleeves, vial closures and stoppers, tourniquets, exercise bands, condoms and prophylactic devices, gloves and glove dip, intervenous bags and tubing, baby bottle nipples, pacifiers, and teething devices, breast hoods, and dental and orthodontic devices.